REMARKS/ARGUMENTS

Favorable reconsideration of this application, in light of the present amendments and following discussion, is respectfully requested.

Claims 1-9, 11, 12, and 18-24 are pending. Claims 1, 2, 5, 8, 9, 11, 12, and 21-25 are presently active; Claims 1, 2, 7, and 9 are amended; Claims 10 and 13-17 are canceled; and Claims 21-24 are newly added herewith. It is respectfully submitted that no new matter is added by this amendment.

In the outstanding Office Action, Claims 1, 2, 5, 8-12, and 18 were rejected under 35 U.S.C. § 102(b) as anticipated by Moise et al. U.S. Pat. No. 6,534,809, (hereafter Moise). For the reasons discussed below, this rejection is respectfully traversed.

Claim 1 has been amended to include the features of original Claim 10. As recited in amended Claim 1 of the present application, an SiO_2 film is used as an interlayer insulating film on a ferroelectric capacitor, and a low-k film is used as an interlayer insulating film on the SiO_2 film.

By way of background, a plasma SiO_2 (PETEOS) film contains less hydrogen than a low-k film because a low-k film has a lower density than a plasma SiO_2 film. Generally, ferroelectric capacitors are sensitive to hydrogen. In other words, the characteristics of ferroelectric capacitors are degraded by exposure to hydrogen. For example, if a low-k film is provided on a ferroelectric capacitor, hydrogen may intrude through a protective film due to heat treatment during the manufacturing process. As a result, the ferroelectric capacitor properties are degraded.

To overcome these difficulties, the claimed invention includes a plasma SiO_2 film as an interlayer insulating film on the ferroelectric capacitor. As a result, degradation of the ferroelectric capacitor by hydrogen is prevented.

Additionally, a low-k film undergoes lower stress than a plasma SiO_2 film. The characteristics of the ferroelectric capacitor degrade increasingly with respect to an increase in stress. By using the claimed low-k film as an interlayer insulating film, it is possible to reduce stress applied to the ferroelectric capacitor.

Moise relates to dry etching FeRAM capacitor stacks. According to Moise, a protective film on a capacitor includes two layers (118 and 120) and layer 120 contacting interlevel dielectric layer 134. Layer 120 is formed of nitride.

By contrast, according to the present invention, the protective film includes one layer, and protective film 7 contacting interlayer insulating film 8 (plasma SiO_2) is formed of oxide, for example. While Moise describes interlevel dielectric layers 134 and 160, there is no disclosure or suggestion of the claimed relationship of materials between interlevel dielectric layer 134 and interlevel dielectric layer 160 of Moise. More specifically, Moise does not disclose the claimed configuration of a plasma SiO_2 film and a low-k film as described in Claim 1.

In addition, according to amended Claim 2 of the present application, a metal oxide, which is reduced by hydrogen, is used as a protective film. As a result, it is possible to suppress the intrusion of hydrogen into the protective film, since a plasma SiO_2 film is used as the interlayer insulating film on a protective film. Consequently, the protective film including a metal oxide can be prevented from being reduced by hydrogen. Through the claimed configuration, it is possible to prevent the release of the plasma SiO_2 film provided on the protective film.

Because Moise does not disclose or suggest the protective film of Claim 2, it is respectfully submitted that Claim 2 also patentably distinguishes over Moise.

Accordingly, as Moise fails to disclose or suggest the features of independent Claim 1, it is respectfully requested that the outstanding rejection of Claims 1, 2, 5, 8-12, and 18 be withdrawn.

Consequently, in view of the foregoing discussion and present amendments, it is respectfully submitted that this application is condition for allowance. An early and favorable action is therefore respectfully requested.

Respectfully submitted,

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